


# Out there on your own: Absence of the spouse and migrants' integration outcomes

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**Abstract**

In many countries, policies on family reunification of migrants are under review. Rules have become more restrictive in a number of cases, with unknown consequences for integration. This paper investigates quantitatively how absence of the spouse affects migrants' integration outcomes, also in the long term. A theoretical model of migrants' investment behaviour predicts that migrants tend to focus on the short term rather than long-term wage growth, until the spouse arrives and the probability of staying increases. Using the American Community Survey, I estimate the effects from absence of the spouse and delays in the spouse's arrival. An instrumental variable is used to isolate the causal effect of delays. The results indicate that migrants focus more on work when their spouse is absent and that delays significantly decrease their long-term wages, by around 2% per year of delay.

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*Key words:* Migration, family, spouse, integration, family separation, family reunification

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# 1 Introduction

A large share of international migrants are married. While many migrate together with their spouse, it happens frequently that one migrant arrives first and thus spends some years in the host country without the spouse. How do periods that migrants spend "out there on their own" affect their integration? Surprisingly little is known on this issue although it has recently risen to prominence in the wake of the surge of asylum seekers arriving in Europe in 2015/2016. Many asylum seekers were married men, hoping to arrange for their spouse and children to join them.

European countries that were still struggling to accommodate the extraordinary numbers of asylum seekers faced a dilemma: if newly recognised refugees were given the same right to family reunification as before, this would mean even higher numbers; if they were not given this right, families' precarious situations would be prolonged and the prospects for integration might be undermined. In the event, two of the countries receiving the largest numbers of asylum seekers – Germany and Sweden – essentially bought themselves some time: refugees notably from Syria were often given subsidiary protection (known as humanitarian protection in the UK) and the rights to family reunification with this status had been suspended. In Sweden, these refugees were granted the right to family reunification in mid-2019. In Germany, efforts to build the coalition that became the current government were on the brink of failure in 2018 until a last-minute compromise was found, allowing family reunification for refugees with subsidiary protection status up to a monthly quota.

In this context, potential adverse consequences from delays in reunification for integration were intensely debated and a severe lack of empirical evidence on this issue became apparent. The question is relevant beyond the management of refugee flows because family reunification is an integral part to most kinds of migration. At the same time, it is subject to conditions in most OECD countries. In the United States, lawful permanent residents (LPR) can apply for reunification with their spouse but need to demonstrate sufficient income as part of the application. In addition, there is an annual cap on the total number of spouses of LPR who may enter the United States.

Across OECD countries, an income requirement is the most frequent condition but other conditions make requirements on the length of stay or the housing situation of the migrant who wishes to bring the spouse. A few countries have set a minimum requirement for the spouse's proficiency in the host-country language. Over time, the rules on family reunification have tended to become more restrictive (Chaloff and Poeschel, 2017), with unknown consequences for migrants' integration prospects.

Data limitations and methodological problems have prevented existing studies from linking periods of family separation to commonly used indicators of integration. This paper uses a large data set from the American Community Survey to investigate how spouse absence and delays in reunification with the spouse affect indicators of migrant

integration. The key challenge is to identify effects that arise only over time and to clarify what is cause and what is consequence. To this end, the paper uses instrumental variable estimation and gives special attention to medium and long-term outcomes. In addition, the paper's empirical part is guided by predictions from a theoretical model.

The paper finds that migrants whose spouse is absent work more – both in terms of higher employment probability and higher hours of work – and migrants who reunited with their spouse only after some delay experience lower wage growth. I interpret this as evidence for a greater focus on the short term: as long as reunification with the spouse has not yet happened, the migrant cannot be too sure to stay in the host country. This uncertainty implies a shorter expected duration of stay – it makes the migrant a temporary migrant. By consequence, migrants focus on work in the short term and neglect investments that would pay off over the longer term, notably in human capital that is specific to the host country. This would explain the finding of lower wage growth among migrants who initially had to wait for reunification with their spouse.

The next section reviews the relevant literature across academic disciplines. Section 3 describes the data used in the analyses. Section 4 offers a theoretical model for the behaviour of migrants who have not yet reunited with their spouse and derives empirically testable predictions. Section 5 lays out the empirical approach, presents results and discusses caveats before Section 6 concludes.

# 2 Review of the literature

A number of studies based on small samples highlight the stress migrants endure while they are separated from their family. Based on a survey of 165 refugees who were resettled to the United States, Miller et al. (2018) conclude that family separation is an important source of stress and can impact refugees' mental health. Using a sample of 113 refugees in Canada, Rousseau, Mekki-Berrada and Moreau (2001) find that family separation can compound the effects of trauma. Caplan (2007) performs a meta-analysis of studies on recent Hispanic immigrants in the United States. According to the analysis, the source of stress most frequently named by migrants is their inability to reunite with their family. Recently, Walther et al. (2019) have confirmed the effects of family separation on stress levels and well-being, using a comparatively large sample of refugees in Germany.

Two similar studies, albeit based on very limited samples, provide first hints of how migrants' integration might be affected. In a survey of 50 recognised refugees in France, Mlati and Duarte (2005) found that refugees who had already reunited with (at least part of) their family were more likely to focus on integration than refugees who were still on their own, waiting to be reunited with family members. Based on 44 refugee families in the United Kingdom, a joint report by the Refugee Council and Oxfam (Beaton, Musgrave and Liebl, 2018) argues not only that refugees who cannot reunite with family members endure stress and sometimes develop mental health issues. It also suggests that these

refugees are unable to focus on language courses and face burdens that had previously been shared. In a more general context (not limited to migrants), Gracia and Herrero (2004) report that stress and depression undermine social integration.

However, these studies do not establish a quantitative link between separation from the family and common indicators of integration such as employment rate, wage levels and proficiency in the host-country language. In most cases, this is impossible because sample sizes are too small, do not include indicators of integration, or lack information beyond one point in time. The only available evidence uses migrants' subjective perceptions instead of quantitative integration indicators: Immigration, Refugees and Citizenship Canada (2014) asked 2000 migrants who sponsored family members between 2007 and 2011 whether, in their opinion, the family members contributed to their integration in Canada. Among migrants who sponsored spouses or partners, 43% indicated that their spouse overall helped them settle in Canada; 40% indicated that the presence of their spouse allowed them to work more hours (40%); and two-thirds indicated that their spouse contributed to household income.

A quantitative investigation of how separation from family members affects observed indicators of integration does not seem to be available, although this has been identified as a gap in the literature (see Bonjour and Kraler (2015) and Charsley et al. (2017)). In a different migration context – that of asylum seekers waiting to be recognised as refugees and to gain labour market access – several such investigations have recently been carried out. They document that initial waiting times can significantly affect later integration outcomes, as measured by common integration indicators (Hainmueller et al. (2016), Marbach et al. (2018), Brenzel and Kosyakova (2019)).

There are reasons to expect significant effects on integration also from initial periods of separation from the family – not only due to stress and frustration with the wait for family reunification, but also due to the uncertainty of the situation that limits the expected duration of stay. After all, family reunification might not happen in the destination country, and the migrant might rather leave to reunite with the family elsewhere. Effects of uncertainty and limited stays on integration have been explored in the context of temporary migrants. Dustmann (1993) argues that temporary migrants tend to invest less in human capital that is specific to the host country, due to the shorter expected stay in the country. By consequence, their wage growth would not be as fast as observed for permanent migrants. This logic implies that initial periods of separation from the family might lead to lower wage growth.

The hypothesis that temporary migrants invest less in country-specific human capital has since gained empirical support. Khan (1997) reports that refugees in the United States invest substantially more in human capital after arrival, compared with other migrants, which might reflect that refugees more often expect to stay indefinitely. Dustmann (1999) finds that temporary migrants invest less in learning the host-country language. Based on French data that include migrants' return intentions, Chabé-Ferret et al. (2018) confirm

that those intending to leave invest significantly less in learning the host-country language. The hypothesis also aligns with basic economic reasoning that any investment depends on the time horizon over which it can pay off.

Limited time horizons likely have further effects on migrants' behaviour. Galor and Stark (1991) point out that migrants' wages might be substantially lower after leaving the destination country again. They argue that intertemporal substitution then implies that migrants who do not fully expect to stay work hard in the destination country while they can. Similarly, Stark and Byra (2019) recently argued that undocumented migrants react to a growing risk of forced return by working more. Dustmann and Mestres (2010) find that migrants who do not expect to stay in the destination country send more money abroad in remittances than migrants who expect to stay. This means that migrants who expect to leave either consume less in the destination country or work harder, using the additional earnings for higher remittances.

Finally, the so-called family investment hypothesis proposes that migrants can invest more in their human capital when they can rely on their spouse's income (Boyd (1989), Long (1990)). By consequence, employment of the migrant's spouse would support the migrant's wage growth. Among others, Cobb-Clark and Crossley (2004) and Creese, Dyck and McLaren (2008) have empirically assessed this hypothesis using data from Australia and Canada, respectively. For migrants who have not yet reunited with their spouse, this implies that they might work more and invest less because they cannot afford to do otherwise.

Overall, the existing literature does not provide a quantitative investigation of how separation from family members affects migrants' integration. However, qualitative evidence as well as findings in other contexts suggest that migrants who are without their family might work more but invest less in human capital. Such behaviour could result from a shorter expected stay in the host country, necessity to earn rather than invest, stress and burdens that undermine efforts to take courses, or any combination of these factors.

# 3 Statistics on absence of the spouse

## 3.1 Data source and sample selection

The empirical analyses throughout this paper draw on micro data from the American Community Survey (ACS) for the years 2013-2017. For this survey, the United States Census Bureau collects data from more than 3.5 million households every year, obtaining a sample that is representative of the population in the United States. It offers a range of variables at the individual level that are crucial for the purposes of this paper but that are often not available in other data sets, such as detailed wages, proficiency in English, and the year in which the individual last married. Information on migration category is

not available. However, migration category is not as relevant for family reunification in the United States as in other OECD countries because rules are the same for all lawful permanent residents.

Table 1: Descriptive statistics

| Variable | Entire sample of married migrants | Subsample of migrants whose spouse is absent | Subsample of first arrivers |
|---|---|---|---|
| Average age | 47.4 | 46.0 | 48.9 |
| Female (%) | 51.9 | 49.4 | 31.1 |
| Have a child aged up to 6 years (%) | 9.7 | 5.1 | 9.0 |
| Hispanic (%) | 32.7 | 33.0 | 40.3 |
| Black (%) | 5.3 | 10.9 | 6.9 |
| Other non-white (%) | 50.1 | 51.6 | 55.7 |
| From South America (%) | 36.3 | 37.9 | 44.4 |
| From Asia (%) | 44.0 | 43.5 | 43.6 |
| From Africa (%) | 5.1 | 7.8 | 4.8 |
| From Europe (%) | 12.7 | 9.2 | 6.4 |
| Average years since migration | 15.3 | 12.4 | 19.5 |
| U.S. citizenship (%) | 3.8 | 3.5 | 7.3 |
| Spouse is absent (%) | 5.1 | 100.0 | 0.0 |
| Have a disability (%) | 5.3 | 4.6 | 9.1 |
| High level of education (%) | 48.9 | 49.2 | 42.1 |
| Medium level of education (%) | 26.7 | 26.7 | 26.6 |
| Low level of education (%) | 24.4 | 24.1 | 31.3 |
| Very high proficiency in English (%) | 30.9 | 28.1 | 31.5 |
| High proficiency in English (%) | 26.9 | 25.7 | 28.0 |
| Medium proficiency in English (%) | 23.9 | 24.9 | 24.9 |
| Other language spoken at home (%) | 91.1 | 88.6 | 93.6 |
| Employed (%) | 69.8 | 76.1 | 80.9 |
| If employed: average weekly hours | 40.1 | 40.6 | 41.0 |
| If employed: median wage (in 2017 USD) | 33,760 | 30,336 | 36,260 |
| Observations on individuals (N) | 216,027 | 11,040 | 32,780 |

Note: The base of percentages does not include missing values. Wages refers to annual gross wages and educational achievement is classified according to ISCED. There appears to be some double counting in variables on racial background.

The ACS includes data on everyone who currently lives in a surveyed household. This allows identifying individuals who are currently married to each other, provided both spouses currently live in the surveyed household. I construct a matched data set on spouses and retain individuals whose spouse is absent, where information on the spouse is therefore missing. This sample is then limited to migrants aged 15-64 who are married to another migrant and who were already married to this spouse when they entered the United States. A migrant is defined as born outside the United States (and not born to

U.S. parents). Since information on absent spouses is missing, cases in which the absent spouse is native-born cannot be excluded from the sample. Key analyses in this paper focus on cases where both spouses are observed, and specifically on the migrant who arrived first in the United States, therefore excluding cases in which spouses arrived at the same time.

The sample of all observed individuals in migrant couples includes 216,000 individuals. For 11,000 of them (5% of the total), the spouse is absent and therefore not observed. About 140,000 individuals arrived in the United States in the same year as their spouse (which cannot be determined when the spouse is absent). Almost 33,000 individuals (15% of the total) can be identified as first arrivers: it is observed that their spouse arrived in a later year. As information on the spouse is needed to identify first arrivers, cases of absent spouses are not included here. The difference between the spouses' years of arrival provides a measure of the delay in the reunification of the spouses. In order to avoid disproportionate influence from outliers, analyses of delay will focus on delays between 1 and 7 years, which leaves 27,000 observations. Table 1 offers descriptive statistics for the entire sample and the two subsamples.

While the three samples described in Table 1 appear similar in many respects, some notable differences arise. Compared with the entire sample, migrants whose spouse is absent are less likely to live together with a young child, more likely to be black, and they tend to have fewer years since migration. They are also more likely to be employed, albeit at a lower average wage. First arrivers are disproportionately often male and are more likely to be Hispanic. They are less often highly-educated and more often low-educated. However, they are especially likely to be employed, earn the highest average wage, and have more often acquired U.S. citizenship, all of which may reflect their longer stay in the United States (20 years on average).

## 3.2 Determinants of absence and delay

Table 2 explores which individual characteristics are associated with absence of the spouse and delays. To this end, absence of the spouse and delays are used as dependent variables in simple regressions on the available individual characteristics. This approach aims at uncovering correlations, so that the estimates should not be given a causal interpretation. As absence of the spouse is a binary variable, a logistic regression is used and results are reported as odds ratios to facilitate their interpretation: an estimate above one suggests that a characteristic is associated with higher incidence of the spouse being absent, while an estimate below one suggests a lower incidence.

The results indicate that absence of the spouse is less likely to occur among female migrants, highly-educated migrants, and those with a very high proficiency in English or with a disability. Where migrants live together with a young child, absence of the spouse is especially rare. Absence of the spouse also appears to become less frequent as

Table 2: Statistical determinants of spouse absence and delays

| Individual characteristic | Odds ratios from a logistic regression with absence of the spouse as dependent variable | Coefficients from a linear regression with delay in years as dependent variable |
|---|---|---|
| Age | 0.89** | 0.04 |
| | (-0.01) | (-0.03) |
| Employed | 1.52** | -0.30** |
| | (-0.05) | (-0.07) |
| Female | 0.94** | 0.56** |
| | (-0.03) | (-0.08) |
| High level of education | 0.93* | -0.80** |
| | (-0.04) | (-0.11) |
| Medium level of education | 0.96 | -0.22** |
| | (-0.03) | (-0.09) |
| Speaks English very well | 0.86** | -0.09 |
| | (-0.05) | (-0.15) |
| Speaks English well | 0.92 | -0.25* |
| | (-0.05) | (-0.13) |
| Speaks some English | 1.03 | -0.24* |
| | (-0.05) | (-0.13) |
| Other language at home | 0.68** | 0.74** |
| | (-0.04) | (-0.18) |
| Has U.S. citizenship | 1.08 | 1.57** |
| | (-0.09) | (-0.19) |
| Has a disability | 0.73** | 0.01 |
| | (-0.05) | (-0.17) |
| Hispanic | 1.48** | -0.15 |
| | (-0.10) | (-0.19) |
| Black | 2.76** | 0.60** |
| | (-0.19) | (-0.19) |
| Other non-white | 1.32** | -0.33** |
| | (-0.05) | (-0.09) |
| Has child up to 6 years | 0.36** | 0.56** |
| | (-0.02) | (-0.10) |
| Years since migration | 0.95** | 0.17** |
| | (0.00) | (-0.01) |
| Origin fixed effects | Yes | Yes |
| Age of spouse | – | 0.00 |
| | | (-0.01) |
| Spouse has a disability | – | 1.81** |
| | | (-0.12) |
| Spouse speaks English v. well | – | -0.98** |
| | | (-0.10) |
| Spouse speaks English well | – | -0.89** |
| | | (-0.08) |
| Spouse has high education | – | -0.25** |
| | | (-0.09) |
| N | 216,027 | 32,780 |

Note: * indicates statistical significance at the 10% significance level, ** at the 5% significance level. Brackets indicate standard errors. Both regressions included a constant (insignificant).

the number of years since migration grows and migrants turn older. Compared to white migrants, Hispanic migrants are 50% or more likely to live without their spouse, and black migrants are almost three times as likely. Absence of the spouse also seems linked to the migrant's employment status, which is investigated further below.

Delays largely fall into the range from 1 to 10 years but can exceed 40 years in a small number of extreme cases. The average delay reaches 4.5 years, but the median delay is 2 years. Given the variation in the dependent variable, a standard linear regression is used. In this case, information on the spouse can also be included in the regression. The results indicate that delays tend to be lower when the first-arriving migrant has a high or medium level of education, a high or medium proficiency in English, and is currently employed. Delays also appear lower for migrants from Europe or South America. Delays tend to be higher when the first-arriving migrant is female. Longer delays are naturally associated with longer duration of stays, which might explain why living together with a young child and U.S. citizenship seem associated with longer delays. Delays also appear linked to characteristics of the spouse: they are higher when the spouse has a disability but lower when the spouse is highly-educated, speaks English well or very well.

# 4 Predicted effects in a theoretical model

The results in the previous section cannot distinguish between causation and correlation – and where there is a causal link, it is unclear which variable is cause and which one is consequence. Indeed, disentangling these possibilities is the key challenge for an investigation of how absence of the spouse affects migrants' integration outcomes. In addition to the empirical techniques used below, some guidance can be provided by a theoretical model that predicts specific effects on integration outcomes. This section therefore adapts an unpublished model laid out in Adda, Dustmann and Görlach (2014). Their model is itself an application of dynamic formulations widely used in labour economics to a migration context.

## 4.1 Set-up of the model

The model is set in discrete time. During a period $t$, the migrant can derive utility from consumption $c_t$ and leisure $l_t$. The utility function takes on the canonical Cobb-Douglas specification:

$$u_t = c_t^{\alpha} l_t^{\beta} = c_t^{\alpha} \left(1 - h_t - s_t\right)^{\beta} \tag{1}$$

where leisure is expressed as the time remaining after subtracting hours of work $h_t$ and time spent on investments $s_t$ from the total time endowment, normalised to 1. Investment here means acquiring human, social or cultural capital that is specific to the host country,

in the sense that this capital is essentially worthless outside the host country. For example, such investment could include learning the local language, building professional networks and acquiring knowledge about institutions and customs in the host country's labour market. Savings and remittances are not made explicit in the model but are considered part of $c_t$, alongside all other expenses. The migrant can cover the costs for all expenses only by working, so that expenses must equal the income from work:

$$c_t = h_t e^{\gamma_{t-1}+s_{t-1}+f(X_t)} \tag{2}$$

where the price level is normalised to 1 and $e^{\gamma_{t-1}+s_{t-1}+f(X_t)}$ is an exponential expression of the migrant's wage. The wage is a function of the migrant's characteristics $X_t$ and depends on the migrant's investment so far in host-country specific human capital, $\gamma_t = \gamma_{t-1} + s_{t-1}$ (i.e. the stock of investments in period $t$ is the sum of last period's stock and additional investment undertaken during the last period).

Next, these elements are placed in a dynamic setting. The value $V$ of the migrant's current situation in the host country ("HC") is the sum of the per-period utility (maximised through optimal choices of $h_t$ and $s_t$) and the expected value of the next period, which is either spent in the host country (with probability $p_{t+1}$) or spent back in the origin country ("OC", with probability $1 - p_{t+1}$):

$$V_t^{HC} = \max_{h_t, s_t} u_t + \delta E\left[p_{t+1} V_{t+1}^{HC} + (1 - p_{t+1}) V_{t+1}^{OC}\right] \tag{3}$$

where $\delta$ is the discount factor and $E$ is the expectations operator. Finally, next period's values consist of an expected part and an i.i.d. shock with expectation 0:

$$V_{t+1}^{HC} = E\left[V_{t+1}^{HC}\right] + \omega^{HC}, \quad V_{t+1}^{OC} = E\left[V_{t+1}^{OC}\right] + \omega^{OC} \tag{4}$$

The shocks can be thought of as unexpected events that might occur in the host country or in the origin country and affect the migrant's situation. The migrant's return decision can then be expressed as:

$$\max\left[E[V_{t+1}^{HC}] + \omega^{HC}, E[V_{t+1}^{OC}] + \omega^{OC}\right] = \max\left[E[V_{t+1}^{HC}] - E[V_{t+1}^{OC}], \omega^{OC} - \omega^{HC}\right] \tag{5}$$

This says that the migrant stays in the host country whenever the expected value of being there next period exceeds the expected value of being in the origin country next period, unless unexpected events overturn this comparison and ultimately lead the migrant to leave the host country. Similarly, the migrant returns to the host country whenever the expected value of being there next period exceeds the expected value of being in the host country next period, unless this is overturned by events. Letting $\varepsilon = \omega^{OC} - \omega^{HC}$, it

follows from equation (5) that the migrant stays with probability

$$p_{t+1} = \Pr\left[\varepsilon \leq E[V_{t+1}^{HC}] - E[V_{t+1}^{OC}]\right] = F\left(E[V_{t+1}^{HC}] - E[V_{t+1}^{OC}]\right) \tag{6}$$

where $F(\cdot)$ is the cumulative density function for the composite shock $\varepsilon$.

## 4.2 The migrant's optimal choices

Using equation (2) to substitute for $c_t$ in equation (1), and then using equation (1) to substitute for $u_t$ in equation (3), one can rewrite equation (3) as

$$V_t^{HC} = \max_{h_t, s_t} h_t^{\alpha} e^{\alpha(\gamma_{t-1} + s_{t-1} + f(X_t))}(1 - h_t - s_t)^{\beta} + \delta E\left[p_{t+1} V_{t+1}^{HC} + (1 - p_{t+1}) V_{t+1}^{OC}\right] \tag{7}$$

In order to maximise the value of the current situation, $V_t^{HC}$, the migrant can choose hours $h_t$ and host-country specific investment $s_t$. As $E[V_{t+1}^{HC}]$ and $E[V_{t+1}^{OC}]$ are defined in analogy to $V_t^{HC}$, they both include $h_{t+1}$ but not $h_t$. Therefore, the expectations of next period's values are irrelevant for the choice of $h_t$, and the first-order condition for the optimal choice of $h_t$ is

$$\begin{aligned} \frac{\delta V_t^{HC}}{\delta h_t} &= \alpha h_t^{\alpha-1} e^{\alpha(\gamma_{t-1} + s_{t-1} + f(X_t))}(1 - h_t - s_t)^{\beta} \\ &\quad - h_t^{\alpha} e^{\alpha(\gamma_{t-1} + s_{t-1} + f(X_t))} \beta (1 - h_t - s_t)^{\beta - 1} = 0 \end{aligned} \tag{8}$$

After dividing by $e^{\alpha(\gamma_{t-1} + s_{t-1} + f(X_t))}$ and collecting terms, this becomes

$$\alpha h_t^{-1} = \beta (1 - h_t - s_t)^{-1} \tag{9}$$

Solving this for $h_t$ identifies the migrant's optimal choice of hours of work as

$$h_t = \frac{\alpha}{\alpha + \beta}(1 - s_t) \tag{10}$$

The migrant's choice of $s_t$ involves an intertemporal dimension: undertaken in period $t$, $s_t$ then contributes to the stock of investment in all following periods spent in the host country, so that $E[V_{t+1}^{HC}], E[V_{t+2}^{HC}] \ldots$ all depend on $s_t$. It follows that $p_{t+1}$ also depends on $s_t$: by raising the expected value of staying in the host country, investment in host-country specific capital raises the probability of staying. By contrast, $E[V_{t+1}^{OC}]$ does not depend on $s_t$ because host-country specific capital is assumed to be essentially worthless in the origin country. Terms in equation (7) that depend on $s_t$ can be written as

$$\begin{aligned} & h_t^{\alpha} e^{\alpha(\gamma_{t-1} + s_{t-1} + f(X_t))}(1 - h_t - s_t)^{\beta} + \\ & \sum_{l=1}^{L} \delta^l E\left(\left[\prod_{j=1}^{l} p_{t+j}\right] h_{t+l}^{\alpha} e^{\alpha(\gamma_{t+l-1} + s_{t+l-1} + f(X_{t+l}))}(1 - h_{t+l} - s_{t+l})^{\beta}\right) \end{aligned} \tag{11}$$

by successively spelling out values across periods, where $l = 1, 2 \dots L$ refers to future periods of the migrant's working life. Then the first-order condition $(\delta V_t^{HC})/(\delta s_t) = 0$ gives, using the product rule,

$$h_t^{\alpha} e^{\alpha(\gamma_{t-1}+s_{t-1}+f(X_t))} \beta (1 - h_t - s_t)^{\beta-1} = \tag{12}$$
$$\sum_{l=1}^{L} \delta^l E \left( h_{t+l}^{\alpha} e^{\alpha(\gamma_{t+l-1}+s_{t+l-1}+f(X_{t+l}))} (1 - h_{t+l} - s_{t+l})^{\beta} \left( \frac{\delta}{\delta s_t} \prod_{j=1}^{l} p_{t+j} + \alpha \prod_{j=1}^{l} p_{t+j} \right) \right)$$

The left-hand side of equation (12) is the marginal cost of raising $s_t$, incurred in period $t$. The right-hand side is the marginal benefit, which consists of two parts: the effect that raising $s_t$ raises the probability of staying in all future periods, and the effect that raising $s_t$ raises all expected future wages at marginal rate $\alpha$.

## 4.3 Changes from absence of the spouse

The only assumption made on migrants whose spouse is absent is that they do not enjoy their leisure time as much, because the person with whom they would most like to spend some of their leisure time is absent. Formally, this means that the weight $\beta$ is lower for migrants whose spouse is absent. This leads to two predictions immediately, and indirectly to a third one:

1. By equation (10), hours of work are higher for migrants whose spouse is absent.

2. By equation (1), the utility they derive from a period in the host country is lower, other things being equal. As this informs the migrant's expectation of utility in the next period, $E[V_{t+1}^{HC}]$ also decreases. By consequence, $E[V_{t+1}^{HC}] - E[V_{t+1}^{OC}]$ decreases, so that $p_{t+1}$ decreases according to equation (6). This means that migrants whose spouse is absent are less likely to stay – essentially because they do not enjoy staying in the host country as much as others.

3. In equation (12), the marginal cost of raising $s_t$ is lower when $\beta$ is lower: since leisure time is less valuable, more of it may be allocated to investment. However, given the decrease in the probability of staying when $\beta$ is lower, the marginal benefit also decreases because the expected duration of stay in the host country falls. This second effect should dominate in most cases, so that less host-country specific investment $s_t$ is undertaken because the time horizon for the investment to pay off is shorter. Formally, on the left-hand side of equation (12), $\beta$ appears as scalar and power. On the right-hand side, it also appears as power and it affects the probability of staying in every period. The products of these probabilities multiply the effect of a lower $\beta$, which should outweigh the effect of the scalar on the left-hand side under most circumstances.

In short, the theoretical model predicts that migrants whose spouse is absent work more and invest less in long-term wage growth. These predictions are next tested empirically.

# 5 Estimation and results

## 5.1 Hours of work

In order to estimate how the spouse's absence impacts the migrant's hours of work, I essentially compare hours of work between migrants whose spouse is absent and migrants whose spouse is present, while controlling for a range of other factors. The dependent variable refers to usual weekly hours actually worked at the time of the survey. As this is a continuous variable, a log-linear empirical model is chosen for this estimation:

$$Y_i = \exp\left(\beta_0 + \beta_1 A_i + X_i^{'}\beta_2 + \eta_i + \epsilon_i\right) \tag{13}$$

which includes an indicator $A_i$ for the spouse being absent or not, a vector $X_i^{'}$ of individual characteristics of migrant $i$, a fixed effect $\eta_i$ for the migrant's occupation, a constant $\beta_0$ as well as random error $\epsilon_i$. The parameter of interest is $\beta_1$ and the estimation uses the employed individuals in the entire sample of married migrants (see Table 1). In 5% of these observations, the spouse is absent and the spouse characteristics are not observed, so that spouse characteristics cannot be included here. (The sample is nevertheless limited to migrants who were already married at the time of arrival.)

Estimation results for the full sample and for men and women separately are reported in Table 3. In the results for the full sample and for men, most explanatory variables are statistically significant at the 5% significance level. In the results for women, only somewhat more than half of the explanatory variables are statistically significant. This likely reflects that the included explanatory variables are less important for women's hours of work than for men's hours of work. Coefficients typically have the expected sign. For example, being female appears associated with a decrease in hours of work by 16%, which reflects the higher incidence of part-time work among women. However, it is surprising that the presence of a young child in the household does not seem to affect either parent's hours of work.

The estimates for the parameter of interest are always statistically significant at the 5% level. They suggest that absence of the spouse is associated with higher hours of work: by 3% in the full sample, by only 1.6% for men but 5% for women. These estimates are in line with the predictions from the theoretical model (Section 4) and the expectations derived from existing literature (Section 2). Their size is not implausible and tests reject the hypothesis that the true effects might be the same for men and women. As the characteristics of the spouse are unobserved when the spouse is absent, the estimates refer to the cumulative effect of the spouse's absence and the spouse characteristics (later

Table 3: Coefficients from log-linear regressions with hours of work as dependent variable

| Individual characteristic | Full sample | Men only | Women only |
|---|---|---|---|
| Spouse is absent | 0.030** | 0.016** | 0.050** |
| | (-0.005) | (-0.005) | (-0.008) |
| Age | 0.011** | 0.013** | 0.010** |
| | (-0.001) | (-0.001) | (-0.002) |
| Age squared | -0.0001** | -0.0002** | -0.0001** |
| | (0.0000) | (0.0000) | (0.0000) |
| Female | -0.157** | – | – |
| | (-0.003) | | |
| High education level | 0.012** | 0.014** | 0.015* |
| | (-0.004) | (-0.004) | (-0.008) |
| Medium education level | 0.003 | 0.000 | 0.013** |
| | (-0.003) | (-0.004) | (-0.007) |
| Speaks English v. well | 0.036** | 0.040** | 0.024** |
| | (-0.005) | (-0.006) | (-0.010) |
| Speaks English well | 0.014** | 0.023** | 0.001 |
| | (-0.005) | (-0.005) | (-0.009) |
| Speaks some English | 0.005 | 0.013** | -0.008 |
| | (-0.005) | (-0.005) | (-0.009) |
| Other language at home | -0.032** | -0.047** | -0.008 |
| | (-0.007) | (-0.007) | (-0.013) |
| Has a disability | 0.010** | -0.003 | 0.021** |
| | (-0.005) | (-0.006) | (-0.008) |
| Black | 0.022** | -0.031** | 0.095** |
| | (-0.007) | (-0.008) | (-0.013) |
| Other non-white | 0.015** | -0.003 | 0.044** |
| | (-0.003) | (-0.003) | (-0.007) |
| Hispanic | 0.002 | -0.002 | 0.009 |
| | (-0.007) | (-0.006) | (-0.014) |
| Has child up to 6 years | 0.002 | -0.001 | 0.007 |
| | (-0.004) | (-0.004) | (-0.009) |
| Years since migration | 0.002** | 0.002** | 0.001** |
| | (0.000) | (0.000) | (0.000) |
| Origin fixed effects | Yes | Yes | Yes |
| Occupation fixed effects | Yes | Yes | Yes |
| N | 150,800 | 90,621 | 60,179 |

Note: Only employed individuals are included. * indicates statistical significance at the 10% significance level, ** at the 5% significance level. Brackets indicate robust standard errors. An indicator for U.S. citizenship proved statistically insignificant in all regressions and was dropped here. All regressions included a constant.

estimations will show that spouse characteristics matter).

Another issue is to what extent these estimates can be given a causal interpretation. The absence of the spouse might well have a causal effect on hours of work due to lower value of leisure time and increased uncertainty, for example (see Section 4). On the other hand, it cannot be ruled out that current hours of work are linked with income needed for the reunification with the spouse: currently low hours of work might reflect low hours of work also in the past, and resulting low income may have prevented the reunification with the spouse. In this scenario, however, one would expect that migrants whose spouse is absent work fewer hours, in contrast with the results in Table 3. Current efforts to work more hours in order to generate income for the reunification with the spouse would again reflect a causal effect from absence of the spouse on hours of work.

As a way to investigate causality further, Table A1 in the Appendix reports results for migrants more than seven years after arrival. After this time, it should be rare that migrants still lack the income needed for reunification with the spouse, and absence of the spouse should typically be due to other factors. Estimates in Table A1 are very similar to those in Table 3, notably the estimates for absence of the spouse. This suggests that concerns about hours of work causing the absence of the spouse seem unwarranted. By consequence, the estimates in Table 3 may be given a causal interpretation: absence of the spouse seems to significantly raise hours of work, especially for women.

Other estimated coefficients in Table 3 point to further effects. Hours of work appear to increase with duration of stay in the host country (by 0.2% for each year since migration in the full sample and for men, by 0.1% for women). A high education level is associated with slightly higher hours of work in all three regressions. Speaking English very well seems to have a larger positive effect, raising hours of work by 3.6% in the full sample, 4% for men and 2.4% for women. In the full sample and for men, speaking another language at home is associated with significantly lower hours of work. Given that the proficiency in English is accounted for, it is not clear what this result indicates. For example, it could indicate a lack of social or cultural capital. Finally, hours of work appear to be substantially higher in the case of black women (by 9.5%) while they are lower in the case of black men (by 3.1%).

## 5.2 Employment

As hours of work are only defined for employed individuals, they capture the intensive effect on work, while there may also be an extensive effect – how many individuals are employed in the first place. With being employed (Y/N) as binary dependent variable, a logistic model is chosen:

$$\Pr(Y_i = 1|X_i) = \frac{1}{1+e^{-x}} \text{ with } x = \beta_0 + \beta_1 A_i + X_i^{'}\beta_2 + \epsilon_i \tag{14}$$

The estimation thus includes the same explanatory variables as before, except fixed effects for occupations because occupations are often not defined for individuals who are not currently employed. To make the results of the logistic regression easier to interpret, Table 4 reports odds ratios instead of coefficients (while standard errors refer to the coefficients). The sample is larger than for hours of work because it also includes non-employed individuals.

With few exceptions, statistically significant odds ratios are estimated for all included explanatory variables, across the regressions for the full sample, men and women. Beginning with the parameter of interest, migrants whose spouse is absent appear to be almost 1.5 times as likely to be employed as migrants whose spouse is present. While this estimate is statistically significant, it appears driven by the estimate for women (1.6 times as likely), as the estimate for men is insignificant. The hypothesis that the true effects might be the same for men and women is rejected.

The issue of causality is very similar in this context as for hours of work. While a lack of income from employment might prevent migrants from reunifying with the spouse, this would imply that migrants whose spouse is absent are less likely to be employed. Table A2 reports results for a regression limited to migrants more than seven years after arrival, when it should be rare that income still prevents reunification with the spouse. These results are very similar to those in Table 4, which indicates that the latter are not biased by reverse causality. Instead, estimates in Table 4 may be given a causal interpretation. In addition, the estimate for men is statistically significant in Table A2, so that a positive effect on the probability for employment also materialises for men after some initial years of stay.

The joint explanatory power of all variables in Table 4 is rather low, which might signal that important variables are missing from the estimation, and their omission can bias the results. However, the size of the estimates for absence of the spouse makes it likely that a positive link to employment probability remains after correcting for bias. All three regressions produce similar estimates for the role of education and language proficiency, all of which are statistically significant. Migrants with a high education level are about 1.4 times as likely to be employed, compared to a low education level. With a medium education level, they are about 1.3 times as likely. Migrants who speak English very well are more than twice as likely (about 2.4) to be employed as migrants who essentially do not speak English. For those speaking English well, this odds ratio is still 1.7. While speaking only some English does not seem to matter for hours of work, it does make migrants about 1.3 times as likely to be employed.

Increasing duration of stay is associated with a significantly higher probability of being employed, by about 2% for every year since migration. In contrast to the results on hours of work, living with a young child seems to make a significant difference for women's employment probability. Also the variables on racial background matter more in this context, indicating higher employment probabilities of Hispanic men and other non-white

Table 4: Odds ratios from logistic regressions with being employed (Y/N) as dependent variable

| Individual characteristic | Full sample | Men only | Women only |
|---|---|---|---|
| Spouse is absent | 1.470** | 1.067 | 1.613** |
| | (-0.469) | (-0.057) | (-0.62) |
| Age | 1.347** | 1.337** | 1.318** |
| | (-0.008) | (-0.015) | (-0.010) |
| Age squared | 0.997** | 0.996** | 0.997** |
| | (0.0000) | (0.0000) | (0.0000) |
| Female | 0.154** | – | – |
| | (-0.002) | | |
| High education level | 1.401** | 1.473** | 1.432** |
| | (-0.029) | (-0.057) | (-0.036) |
| Medium education level | 1.254** | 1.201** | 1.315** |
| | (-0.024) | (-0.041) | (-0.03) |
| Speaks English v. well | 2.395** | 2.423** | 2.323** |
| | (-0.066) | (-0.127) | (-0.077) |
| Speaks English well | 1.701** | 1.663** | 1.679** |
| | (-0.043) | (-0.079) | (-0.052) |
| Speaks some English | 1.300** | 1.271** | 1.296** |
| | (-0.030) | (-0.056) | (-0.037) |
| Other language at home | 0.643** | 0.569** | 0.698** |
| | (-0.022) | (-0.036) | (-0.028) |
| Has U.S. citizenship | 1.016 | 0.94 | 1.041 |
| | (-0.041) | (-0.074) | (-0.048) |
| Has a disability | 1.156** | 0.974 | 1.230** |
| | (-0.039) | (-0.058) | (-0.047) |
| Hispanic | 1.116** | 1.547** | 0.993 |
| | (-0.043) | (-0.115) | (-0.046) |
| Black | 1.756** | 0.928** | 2.359** |
| | (-0.078) | (-0.069) | (-0.124) |
| Other non-white | 1.251** | 1.419** | 1.212** |
| | (-0.023) | (-0.053) | (-0.027) |
| Has child up to 6 years | 0.857** | 0.928 | 0.780** |
| | (-0.019) | (-0.042) | (-0.022) |
| Years since migration | 1.020** | 1.015** | 1.019** |
| | (-0.001) | (-0.002) | (-0.001) |
| Origin fixed effects | Yes | Yes | Yes |
| N | 216,027 | 104,016 | 112,011 |

Note: * indicates statistical significance at the 10% significance level, ** at the 5% significance level. Brackets indicate robust standard errors. All regressions included a constant.

individuals, compared to white individuals. For black individuals, the same patter arises as for hours of work: while black women are more than twice as likely to be employed as white women, black men are less likely to be employed than white men. These findings likely reflect outcomes of black migrants from South America, who account for 38% of black migrants in the full sample and for 45% in the sample of first arrivers. Notably for black migrants from the West Indies, studies have documented favourable outcomes on the labour market (e.g. Model 1995). With regards to citizenship, there does not appear to be an "employment premium" for U.S. citizens.

Finally, it is worth noting that key results for hours of work and employment probability arise similarly when the sample is restricted to migrants who have stayed in the United States for up to seven years. This restriction makes it especially likely that an absent spouse is still abroad, as opposed to some other explanation. For the restricted sample including men and women, absence of the spouse is associated with an increase in hours of work by 2.5% (1.5% for men and 4.4% for women). These estimates are statistically significant at the 5% level except the estimate for men (10% level). With regards to employment probability, spouse absence is associated with an odds ratio of 1.65 in the sample including men and women (1.19 for men and 1.95 for women), and these estimates are all statistically significant at the 5% level. Hence the results for employment probability strengthen in the restricted sample.

## 5.3 Wage levels

A different approach is taken to estimate effects on wage levels. In this case, the sample exists of migrants who arrived first and eventually reunited with their spouse (see Table 2). Instead of current absence of the spouse, the length of the initial delay is used as an explanatory variable. This allows relating initial absence of the spouse to wage levels that are observed later. Since the spouse has eventually arrived in all cases, the characteristics of the spouse can be included in the estimation as explanatory variables. As for hours of work, a log-linear empirical model is chosen:

$$Y_i = \exp\left(\beta_0 + \beta_1 d_i + X_i'\beta_2 + Z_i'\beta_3 + \eta_i + \epsilon_i\right) \tag{15}$$

which now includes a measure of the initial delay in years $d_i$ and a vector $Z_i'$ of variables on the spouse of migrant $i$. The vector $X_i'$ here includes hours of work, in addition to the variables used earlier. Since a wage regression has to be limited to employed individuals, this regression includes fixed effects for occupation $\eta_i$. Unfortunately, a measure of work experience or job tenure is not available from the ACS (see the next section).

I exclude cases with delays of more than seven years from the sample of first arrivers, which drops 19% of the observations. The hypothesised uncertainty due to the absence of the spouse might not apply to these cases: such long delays suggest that another arrangement may have been found, or that uncertainty about the migrant's duration of

stay has diminished for other reasons. I also exclude cases with less than 3 years of stay, as the effect of human capital investments on wage growth arise only over time. This drops 3.5% of the observations. The data on wages refer to gross annual wages in USD and are inflation-adjusted to 2017 USD. Wages are trimmed in the sense that zero wages are dropped and values above a cut-off are recorded at the cut-off level.

Estimation results are reported in Table 5. The estimates for the full sample and for men are statistically significant at the 5% level, with only few exceptions. In the regression for women, more estimates are insignificant, which is likely a consequence of the substantially smaller sample size for women. Estimated coefficients typically have the expected sign. The estimates for the parameter of interest are significant in the full sample and for men. They suggest that every year of delay decreases wages by 1.5% and 1.6%, respectively. These results again align with the theoretical prediction in Section 4 and the literature in Section 2. The magnitude of the estimated decrease for women is comparatively low, so that it might be statistically significant in a larger sample. In addition, standard errors of the estimate for women are relatively high, and the hypothesis that the true effect for women also equals 1.6% cannot be rejected. At the same time, the hypothesis that the true effect for men is as low as the estimate for women is rejected.

As one would expect, education and language proficiency appear to contribute significantly to wages. A high education level is associated with an increase in wages by about 30%, a medium level of education is associated with an increase by 5% for men but 12% for women (6% in the full sample). Speaking English very well appears to raise wages likewise by close to 30%. Speaking English well is still associated with increases of 15% for men and 9% for women, while speaking some English is significant only for men (increase by 8%). Surprisingly, U.S. citizenship is associated with lower wages (by 10%) for men and in the full sample. Estimated coefficients for racial backgrounds are mostly insignificant, except that black and other non-white women appear to earn higher wages (increases by 16% and 7%, respectively). Across all regressions, wages seem to increase by almost 1% with every year since migration.

Several coefficients for spouse variables are also statistically significant. A high education level of the spouse is associated with an increase around 12% for men and in the full sample, a medium education level is still associated with an increase around 4%. If the spouse speaks English very well, this is associated with an increase around 5% for men and in the full sample. There is also a positive link with the spouse's wage (which is set to zero when the spouse is not employed). These results could arise for several reasons, including positive assortative matching – spouse are similar to each other – and the spouse's help with finding better paying jobs. The role that the spouse's characteristics play for the migrant's integration is further investigated in Poeschel (2020).

Very similar results are obtained when the estimation procedure matches observations on their years since migration, by instead including fixed effects for every year since migration. (To ensure that observations can be matched, cases with more than 40 years of

Table 5: Coefficients from log-linear regressions with wages as dependent variable

| Individual characteristic | Full sample | Men only | Women only |
|---|---|---|---|
| Years of delay | -0.015** | -0.016** | -0.007 |
| | (-0.003) | (-0.004) | (-0.007) |
| Weekly hours | 0.024** | 0.021** | 0.032** |
| | (-0.001) | (-0.001) | (-0.002) |
| Age | 0.031** | 0.033** | 0.029** |
| | (-0.006) | (-0.006) | (-0.012) |
| Age squared | -0.0004** | -0.0004** | -0.0003** |
| | (-0.0001) | (-0.0001) | (-0.0001) |
| Female | -0.291** | – | – |
| | (-0.018) | | |
| High education level | 0.290** | 0.302** | 0.297** |
| | (-0.025) | (-0.028) | (-0.053) |
| Medium education level | 0.055** | 0.045** | 0.117** |
| | (-0.019) | (-0.019) | (-0.049) |
| Speaks English v. well | 0.284** | 0.280** | 0.299** |
| | (-0.027) | (-0.032) | (-0.055) |
| Speaks English well | 0.133** | 0.148** | 0.093* |
| | (-0.024) | (-0.028) | (-0.053) |
| Speaks some English | 0.054** | 0.075** | -0.011 |
| | (-0.023) | (-0.026) | (-0.050) |
| Other language at home | -0.287** | -0.292** | -0.243** |
| | (-0.037) | (-0.045) | (-0.067) |
| Has U.S. citizenship | -0.094** | -0.102** | -0.082 |
| | (-0.031) | (-0.044) | (-0.041) |
| Hispanic | -0.002 | -0.015 | 0.047 |
| | (-0.036) | (-0.041) | (-0.074) |
| Black | 0.027 | -0.052 | 0.161** |
| | (-0.036) | (-0.041) | (-0.074) |
| Other non-white | 0.016 | -0.004 | 0.073* |
| | (-0.016) | (-0.018) | (-0.039) |
| Years since migration | 0.008** | 0.008** | 0.008** |
| | (-0.001) | (-0.001) | (-0.002) |
| Origin fixed effects | Yes | Yes | Yes |
| Occupation fixed effects | Yes | Yes | Yes |
| Spouse: age | 0.004** | 0.005** | 0.001** |
| | (-0.001) | (-0.002) | (-0.003) |
| Spouse: wage level | $1.00/10^{6}$** | $1.16/10^{6}$** | $9.83/10^{7}$** |
| | $(1.35/10^{7})$ | $(1.79/10^{7})$ | $(2.05/10^{7})$ |
| Spouse: high education level | 0.117** | 0.125** | 0.043 |
| | (-0.022) | (-0.026) | (-0.047) |
| Spouse: medium education level | 0.033* | 0.040** | -0.014 |
| | (-0.018) | (-0.019) | (-0.046) |
| Spouse: speaks English v. well | 0.046* | 0.063** | -0.026 |
| | (-0.024) | (-0.027) | (-0.049) |
| Spouse: speaks English well | 0.015 | 0.022* | -0.021 |
| | (-0.021) | (-0.024) | (-0.047) |
| Spouse: speaks some English | 2θ0.010 | -0.006 | -0.029 |
| | (-0.018) | (-0.020) | (-0.043) |
| N | 19,926 | 15,170 | 4,756 |

stay are dropped in this context.) This suggests that results are not biased by systematic differences in years since migration across the values for delay.

However, reverse causality is a major concern for the results in Table 5. It is not difficult to imagine that delays in reunification were a consequence of low wages during the initial years of the migrant's stay. As pointed out before, applications for family reunification to U.S. authorities require that migrants demonstrate sufficiently high income. In addition, migrants with low wages might have to save for some years before they can afford the costs of family reunification, which typically increases the financial support the family needs compared with the origin country, and might entail moving into larger accommodation. Another reason is that migrants with low wages might be especially doubtful about their prospects in the host country, so that they initially do not plan to stay and do not pursue family reunification. Any of these factors can induce a negative link between initial wages and delays in reunification with the spouse. This link can translate into a negative link with wages observed much later if wage levels are correlated over time, so that migrants with low initial wages often also have low wages years later.

Reverse causality would mean that estimates in Table 5 are biased (since delays are then endogenous) and cannot be given a causal interpretation. Another potential problem with the estimates in Table 5 is measurement error: firstly, delays cannot be measured precisely but are rounded to full years. Secondly, survey respondents might not recall the correct year of their arrival in the United States, which would translate into an incorrect measure of the years of delay. If measurement error is an issue, the estimates in Table 5 will underestimate the true effect of delay on wages, due to attenuation bias.

To address these concerns, the analysis of wage levels is repeated using instrumental variable (IV) estimation. A suitable instrument for potentially endogenous delays should be a determinant of delays but should not be determined by wages. Essentially, the instrumental variable should only reflect the part of the empirical relation between wages and delays that is caused by delays. While suitable instruments are hard to find, the spouse's disability status (Y/N) appears to be suitable in this context. It is a strong positive determinant of delays (see Table 2), which is plausible because more preparations might be needed before a spouse with disabilities can reunify with the migrants in the host country. In addition, if the situation in the origin country caters well to any special needs of the spouse, that would be a reason to delay reunification until the migrant firmly expects to stay. By contrast, it does not appear plausible that the migrant's wages somehow determine the spouse's disability status, and these two variables are found to be uncorrelated.

Table 6 reports the results for the IV estimation, using a two-stage least squares procedure (only the second stage is reported here). The estimate reported for delays now refers to the estimate for the instrument, the spouse's disability status. This estimate is significant at the 5% significance level in the full sample and for women, and at the 10% level for men. It suggests that delay decreases wages by 10% in the full sample, 6% for

Table 6: Coefficients from IV regressions with wages as dependent variable

| Individual characteristic | Full sample | Men only | Women only |
|---|---|---|---|
| Years of delay | -0.099** | -0.064* | -0.206** |
| | (-0.034) | (-0.038) | (-0.081) |
| Weekly hours | 0.024** | 0.021** | 0.032** |
| | (-0.001) | (-0.001) | (-0.014) |
| Age | 0.038** | 0.037** | 0.035** |
| | (-0.007) | (-0.008) | (-0.012) |
| Age squared | -0.0004** | -0.0004** | -0.0003** |
| | (-0.0001) | (-0.0001) | (-0.0001) |
| Female | -0.265** | – | – |
| | (-0.022) | | |
| High education level | 0.269** | 0.286** | 0.235** |
| | (-0.027) | (-0.030) | (-0.070) |
| Medium education level | 0.053** | 0.045* | 0.067 |
| | (-0.020) | (-0.020) | (-0.063) |
| Speaks English v. well | 0.300** | 0.285** | 0.372** |
| | (-0.029) | (-0.033) | (-0.070) |
| Speaks English well | 0.147** | 0.153** | 0.146** |
| | (-0.026) | (-0.029) | (-0.064) |
| Speaks some English | 0.058** | 0.075** | 0.033 |
| | (-0.024) | (-0.027) | (-0.063) |
| Other language at home | -0.278** | -0.286** | -0.207** |
| | (-0.037) | (-0.044) | (-0.076) |
| Black | 0.064* | -0.014 | 0.145** |
| | (-0.035) | (-0.043) | (-0.069) |
| Years since migration | 0.010** | 0.009** | 0.014** |
| | (-0.001) | (-0.001) | (-0.003) |
| Origin fixed effects | Yes | Yes | Yes |
| Occupation fixed effects | Yes | Yes | Yes |
| Spouse: age | 0.004** | 0.005** | 0.000 |
| | (-0.002) | (-0.002) | (-0.004) |
| Spouse: wage level | $9.48/10^{7}$** | $1.08/10^{6}$** | $1.01/10^{6}$** |
| | $(1.38/10^{7})$ | $(1.86/10^{7})$ | $(2.36/10^{7})$ |
| Spouse: high education level | 0.096** | 0.111** | 0.038 |
| | (-0.025) | (-0.028) | (-0.057) |
| Spouse: medium education level | 0.030 | 0.053* | 0.027 |
| | (-0.019) | (-0.020) | (-0.058) |
| Spouse: speaks English v. well | 0.009 | 0.042 | -0.127* |
| | (-0.028) | (-0.031) | (-0.067) |
| Spouse: speaks English well | -0.017 | 0.003 | -0.102* |
| | (-0.025) | (-0.027) | (-0.062) |
| Spouse: speaks some English | -0.025 | -0.013 | -0.096* |
| | (-0.019) | (-0.020) | (-0.057) |
| N | 19,926 | 15,170 | 4,756 |

Note: * indicates statistical significance at the 10% significance level, ** at the 5% significance level. Brackets indicate robust standard errors. Years of delay are instrumented by the spouse's disability status. In the estimation for men, insignificant fixed effects for two occupational groups are dropped. All regressions included a constant.

men and 21% for women. While delay is a continuous variable, it was instrumented using a binary variable. The results therefore do not describe the effect of every year of delay but rather the average delay (4.5 years for the full sample, 4.3 for men, 5.0 for women).

The estimates for the full sample and for men therefore point to a causal effect of around 2% per year of delay. The estimate for women appears implausibly high, which is likely a consequence of the smaller sample size for women: due to relatively large standard errors, the hypothesis that the true effect for women also equals 6% cannot be rejected. At the same time, the hypothesis that the true effect for men is as high as 21% is rejected. Importantly, the finding of statistically significant negative coefficients for delay in the IV regression confirms results obtained in Table 5: there appears to be a causal negative effect of delays in reunification on wages. Almost all other estimated coefficients in Table 6 are also in line with results in Table 5, qualitatively and often also quantitatively.

Results for the first stage of the estimation are reported in Table A3 in the Appendix. These results indicate the strength of the instrument: as a rule of thumb, the instrument is a sufficiently strongly linked to the instrumented variable – years of delay – whenever its F-test statistic exceeds 10 (e.g. Stock, Wright and Yogo 2002). Test statistics for the spouse's disability status easily meet this threshold (approaching 157 for the full sample, 126 for men and 30 for women). This indicates that the spouse's disability status is not a weak instrument.

Results for the reduced form in Table A4 in the Appendix provide further insight into the reliability of the instrumental variable estimation. If the spouse's disability status is a valid instrument for years of delay and years of delay affect wages, then the spouse's disability status should matter when it is included in a wage regression that does not include years of delay. The regression in Table A4 is therefore a variant of the regression in Table 5, with the spouse's disability status instead of years of delay (but not used as instrument). As expected, the spouse's disability status is statistically significant in the results in Table A4. At the same time, it is always insignificant when included alongside years of delay in the regressions in Table 5. Together, these findings suggest that the spouse's disability status can capture the effect of delay on wages but does not affect wages in its own right.

## 5.4 Discussion of robustness and caveats

The estimated effects from absence of the spouse are often especially strong for women (see Tables 3-6). There are several possible reasons. One is that sample sizes are lower for women throughout, so that the magnitude of the estimate for them is not as reliable. However, true effects on women's behaviour might be larger than for men. For example, women might focus especially much on work when their spouse is absent because of necessity or because of very strong wishes to send remittances. That apart, it is frequently found that women's labour supply is more elastic, responding more strongly

to circumstances and incentives. By contrast, men's labour supply is often found to be inelastic, partly because it tends to be high no matter the circumstances. Increases in women's labour supply can thus be larger because their labour supply comes from a relatively low average level. The stronger reaction from women then implies that they might also neglect human capital investments especially strongly. This would partly explain the strongly negative effect on their wage growth found in Table 6.

The reported effects of spouse absence on employment or hours of work might operate primarily through a shorter expected duration of stay, essentially reflecting the behaviour of temporary migrants. This makes it nearly impossible to say whether the effect arises because of spouse absence, intentions to stay for a limited duration, or expectations that the current basis for residence in the United States will not last: these cases might strongly overlap. It is therefore possible that spouse absence here only acts as proxy for unobserved plans or knowledge about the expected duration of stay – in contrast to such latent variables, spouse absence is observed and measured rather well. However, the strong results obtained for spouse absence appear fully consistent with the interpretation that the effects arise because of spouse absence, and not merely because spouse absence acts as a proxy for another variable. Such questions do not arise to the same extent for the analysis of wage levels, as the sample in this context only includes couples that eventually reunited, which reduces the overlap with temporary migrants.

In the analyses of wage levels, alternative specifications of the econometric model have been considered. For example, an hourly wage rate may be constructed as dependent variable, or the spouse's wage level may be replaced by a mere indicator of the spouse's employment status. With such changes, the IV estimate for the effect of delay on men's wages (Table 6) often becomes insignificant, falling towards the 20% or 30% significance level. The reason seems to be that the spouse's disability status becomes insignificant in the reduced form (Table A4 in the Appendix), which happens only for men.

At the same time, however, the spouse's disability status remains highly significant in the first stage of the IV estimation, and years of delay remain a significant determinant of wages and wage rates. I interpret these conflicting results as an indication that the IV estimate for men becomes insignificant not because the spouse's disability status is an invalid instrument but because its empirical link with wages is weaker than for women, which renders it statistically insignificant in the sample of men only. In line with this interpretation, the IV estimate for the full sample remains significant although men make up almost 70%. In general, the IV estimates for the effect of delay on wages in the full sample and for women are robust across alternative specifications, remaining statistically significant.

Due to a lack of data, prior work experience or tenure cannot be included although it would very likely be an important determinant of wages. The inclusion of years since migration might, however, mitigate this problem as years since migration likely correlate with total years of work experience in the host country. Hence years since migration might

partly act as proxy for work experience. Next, while higher labour supply during initial years without the spouse implies higher work experience, it is unlikely that this plays a significant role for the estimations. In most cases (when several years have passed since arrival), this early additional work experience is small compared to total work experience. It is therefore unlikely that a sufficient correlation between work experience and delays arises that would allow delays to act as proxy for work experience, which would bias the estimates.

# 6 Concluding remarks

This paper presents quantitative estimates of how absence of the spouse affects migrants' integration. Using detailed data from the United States, I find that migrants tend to work more when the spouse is absent, and that initial delays in reunification with the spouse are associated with lower wage growth. Further results suggest that both findings may be given a causal interpretation. This is reminiscent of temporary migrants whose behaviour reflects their relatively short expected duration of stay. While family reunification has not yet happened, migrants likely face higher uncertainty about their duration of stay. This might plausibly lead to a focus on working and earning in the short term, in line with the results in this paper. At the same time, migrants might neglect investments in human capital that would increase their wages over the longer term. This would explain the finding of lower wage growth among migrants who initially had to wait to reunite with their spouse.

# References


[1] Adda, J., C. Dustmann, and J.-S. Görlach (2014): "Migrant wages, human capital accumulation and return migration," mimeo

[2] Beaton, E., A. Musgrave and J. Liebl (2018): *Safe but not settled: The impact of family separation on refugees in the UK*, Refugee Council and Oxfam

[3] Boyd, M. (1989): "Family and Personal Networks in International Migration: Recent Developments and New Agendas," *International Migration Review* 23/3, 639-670

[4] Bonjour, S. and A. Kraler (2015): "Introduction: Family Migration as an Integration Issue? Policy Perspectives and Academic Insights," *Journal of Family Issues* 36/11, 1407-1432

[5] Brenzel, H. and Y. Kosyakova (2019): "Längere Asylverfahren verzögern Integration und Spracherwerb," *IAB-Kurzbericht* 6/2019

[6] Caplan, S. (2007): "Latinos, Acculturation, and Acculturative Stress: A Dimensional Concept Analysis," *Policy, Politics, & Nursing Practice* 8/2, 93-106

[7] Chabé-Ferret, B., J. Machado and J. Wahba (2018): "Remigration intentions and migrants' behavior," *Regional Science and Urban Economics* 68, 56-72

[8] Chaloff, J. and F. Poeschel (2017): "A portrait of family migration in OECD countries," in *International Migration Outlook 2017*, OECD Publishing, Paris

[9] Charsley, K., M. Bolognani and S. Spencer (2017): "Marriage migration and integration: Interrogating assumptions in academic and policy debates," *Ethnicities* 17/4, 469-490

[10] Cobb-Clark, D. and T. Crossley (2004): "Revisiting the family investment hypothesis," *Labour Economics* 11/3, 373-393

[11] Creese, G., I. Dyck and A. McLaren (2008): "The 'Flexible' Immigrant? Human Capital Discourse, the Family Household and Labour Market Strategies," *Journal of International Migration and Integration / Revue de l'integration et de la migration internationale* 9/3, 269-288

[12] Galor, O. and O. Stark (1991): "The probability of return migration, migrants' work effort, and migrants' performance," *Journal of Development Economics* 35/2, 399-405

[13] Gracia, E. and J. Herrero (2004): "Determinants of social integration in the community: an exploratory analysis of personal, interpersonal and situational variables," *Journal of Community & Applied Social Psychology* 14/1, 1-15

[14] Dustmann, C. (1993): "Earnings adjustment of temporary migrants," *Journal of Population Economics* 6/8, 153-168

[15] Dustmann, C. (1999): "Temporary migration, human capital, and language fluency of migrants," *Scandinavian Journal of Economics* 101/2, 297-314

[16] Dustmann, C. and J. Mestres (2010): "Remittances and temporary migration,"

*Journal of Development Economics* 92/1, 62-70

[17] Hainmueller, J., D. Hangartner and D. Lawrence (2016): "When lives are put on hold: Lengthy asylum processes decrease employment among refugees," *Science Advances* 2/8, p. e1600432

[18] Immigration, Refugees and Citizenship Canada (2014): *Evaluation of the Family Reunification Program*, Research and Evaluation Branch

[19] Khan, A. H. (1997): "Post-migration investment in education by immigrants in the United States," *The Quarterly Review of Economics and Finance* 37, 285-313

[20] Long, J. (1990): "The Effect of Americanization on Earnings: Some Evidence for Women," *Journal of Political Economy* 88/3, 620-629

[21] Marbach, M., J. Hainmueller and D. Hangartner (2018): "The long-term impact of employment bans on the economic integration of refugees," *Science Advances* 4/9, p. eaap9519

[22] Miller, A., J. M. Hess, D. Bybee and J. R. Goodkind (2018): "Understanding the mental health consequences of family separation for refugees: Implications for policy and practice," *American Journal of Orthopsychiatry* 88/1, 26-37

[23] Mlati, F. and C. Duarte (2005): "L'unité familiale, enjeux et impacts sur l'insertion professionnelle des réfugiés statutaires," in *Le regroupement familial des réfugiés*, France Terre d'Asile, Paris

[24] Model, S. (1995): "West Indian prosperity: Fact or fiction?," *Social Problems* 42/4, 535-553

[25] Poeschel, F. (2019): "Family ties: How family reunification can affect migrant integration," in *International Migration Outlook 2019*, OECD Publishing, Paris

[26] Poeschel, F. (2020): "Hand in hand: Integration of couples," mimeo, Migration Policy Centre, European University Institute

[27] Rousseau, C., A. Mekki-Berrada and S. Moreau (2001): "Trauma and Extended Separation from Family among Latin American and African Refugees in Montreal," *Psychiatry: Interpersonal and Biological Processes* 64/1, 40-59

[28] Stark, O. and L. Byra (2019): "Can a Deportation Policy Backfire?," *Public Choice*, 2019, 1-13

[29] Stock, J. H., J. H. Wright and M. Yogo (2002): "A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments," *Journal of Business and Economic Statistics* 20/4, 518-529

[30] Walther, L., L. M. Fuchs, J. Schupp and C. von Scheve (2019): "Living conditions and the mental health and well-being of refugees: Evidence from a large-scale German panel study," SOEP Papers on Multidisciplinary Panel Data Research 1029, DIW

Table A1: Coefficients from log-linear regressions with hours of work as dependent variable, limited to migrants more than 7 years after arrival

| Individual characteristic | Full sample | Men only | Women only |
|---|---|---|---|
| Spouse is absent | 0.033** | 0.015** | 0.053** |
| | (-0.006) | (-0.007) | (-0.009) |
| Age | 0.014** | 0.014** | 0.013** |
| | (-0.002) | (-0.002) | (-0.003) |
| Age squared | -0.0002** | -0.0002** | -0.0001** |
| | (0.0000) | (0.0000) | (0.0000) |
| Female | -0.159** | – | – |
| | (-0.003) | | |
| High education level | 0.010** | 0.014** | 0.012 |
| | (-0.005) | (-0.005) | (-0.009) |
| Medium education level | 0.002 | -0.001 | 0.012* |
| | (-0.004) | (-0.004) | (-0.007) |
| Speaks English v. well | 0.040** | 0.047** | 0.031** |
| | (-0.006) | (-0.007) | (-0.011) |
| Speaks English well | 0.023** | 0.027** | 0.013 |
| | (-0.006) | (-0.006) | (-0.011) |
| Speaks some English | 0.009* | 0.015** | -0.002 |
| | (-0.005) | (-0.006) | (-0.010) |
| Other language at home | -0.036** | -0.047** | -0.02 |
| | (-0.007) | (-0.008) | (-0.014) |
| Has a disability | 0.002 | -0.013* | 0.016* |
| | (-0.006) | (-0.007) | (-0.009) |
| Black | 0.025** | -0.035** | 0.096** |
| | (-0.008) | (-0.009) | (-0.014) |
| Other non-white | 0.009** | -0.008** | 0.036** |
| | (-0.004) | (-0.004) | (-0.007) |
| Hispanic | 0.002 | -0.001 | 0.006 |
| | (-0.008) | (-0.007) | (-0.016) |
| Has child up to 6 years | 0.004 | -0.007 | 0.018* |
| | (-0.006) | (-0.007) | (-0.011) |
| Years since migration | 0.002** | 0.002** | 0.001** |
| | (0.000) | (0.000) | (0.000) |
| Origin fixed effects | Yes | Yes | Yes |
| Occupation fixed effects | Yes | Yes | Yes |
| N | 115,664 | 66,939 | 48,725 |

Note: Only employed individuals are included. * indicates statistical significance at the 10% significance level, ** at the 5% significance level. Brackets indicate robust standard errors. An indicator for U.S. citizenship proved statistically insignificant in all regressions and was dropped here. All regressions included a constant.

Table A2: Odds ratios from logistic regressions with being employed (Y/N) as dependent variable, limited to migrants more than 7 years after arrival

| Individual characteristic | Full sample | Men only | Women only |
|---|---|---|---|
| Spouse is absent | 1.436** | 1.138* | 1.539** |
| | (-0.060) | (-0.084) | (-0.076) |
| Age | 1.416** | 1.286** | 1.397** |
| | (-0.013) | (-0.025) | (-0.016) |
| Age squared | 0.996** | 0.997** | 0.997** |
| | (0.0000) | (0.0000) | (0.0000) |
| Female | 0.174** | – | – |
| | (-0.003) | | |
| High education level | 1.590** | 1.767** | 1.607** |
| | (-0.038) | (-0.081) | (-0.046) |
| Medium education level | 1.233** | 1.251** | 1.279** |
| | (-0.026) | (-0.049) | (-0.032) |
| Speaks English v. well | 2.551** | 2.424** | 2.534** |
| | (-0.081) | (-0.148) | (-0.099) |
| Speaks English well | 1.969** | 1.957** | 1.910** |
| | (-0.056) | (-0.107) | (-0.068) |
| Speaks some English | 1.409** | 1.375** | 1.402** |
| | (-0.037) | (-0.069) | (-0.045) |
| Other language at home | 0.640** | 0.588** | 0.679** |
| | (-0.025) | (-0.044) | (-0.032) |
| Has U.S. citizenship | 0.926* | 0.929 | 0.92 |
| | (-0.042) | (-0.087) | (-0.048) |
| Has a disability | 1.057 | 0.94 | 1.102** |
| | (-0.040) | (-0.066) | (-0.048) |
| Hispanic | 1.000 | 1.229** | 0.921 |
| | (-0.048) | (-0.107) | (-0.052) |
| Black | 1.658** | 0.761** | 2.330** |
| | (-0.089) | (-0.067) | (-0.147) |
| Other non-white | 1.184** | 1.165** | 1.211** |
| | (-0.025) | (-0.049) | (-0.031) |
| Has child up to 6 years | 1.010 | 0.815** | 1.075* |
| | (-0.036) | (-0.052) | (-0.046) |
| Years since migration | 0.993** | 0.987** | 0.995** |
| | (-0.001) | (-0.002) | (-0.001) |
| Origin fixed effects | Yes | Yes | Yes |
| N | 159,316 | 76,236 | 83,080 |

Note: * indicates statistical significance at the 10% significance level, ** at the 5% significance level. Brackets indicate robust standard errors. All regressions included a constant.

Table A3: First stage of IV regressions (years of delay as dependent variable)

| Individual characteristic | Full sample | Men only | Women only |
|---|---|---|---|
| Weekly hours | 0.001 | 0.002 | 0.000 |
| | (-0.002) | (-0.002) | (-0.003) |
| Age | 0.078** | 0.095** | 0.017 |
| | (-0.016) | (-0.017) | (-0.033) |
| Age squared | -0.0007** | -0.0008** | -0.0003 |
| | (-0.0002) | (-0.0002) | (-0.0003) |
| Female | 0.339** | – | – |
| | (-0.047) | | |
| High education level | -0.236** | -0.258** | -0.302* |
| | (-0.071) | (-0.079) | (-0.155) |
| Medium education level | -0.012 | 0.036 | -0.236* |
| | (-0.055) | (-0.060) | (-0.131) |
| Speaks English v. well | 0.161* | 0.010 | 0.335* |
| | (-0.084) | (-0.094) | (-0.186) |
| Speaks English well | 0.127* | 0.096 | 0.232 |
| | (-0.075) | (-0.084) | (-0.169) |
| Speaks some English | 0.024 | -0.017 | 0.206 |
| | (-0.070) | (-0.078) | (-0.161) |
| Other language at home | 0.127 | 0.110 | 0.148 |
| | (-0.101) | (-0.117) | (-0.199) |
| Black | 0.477** | 0.628** | 0.182 |
| | (-0.091) | (-0.111) | (-0.162) |
| Years since migration | 0.018** | 0.015** | 0.025** |
| | (-0.003) | (-0.003) | (-0.005) |
| Origin fixed effects | Yes | Yes | Yes |
| Occupation fixed effects | Yes | Yes | Yes |
| Spouse: has a disability | 0.750** | 0.815** | 0.582** |
| | (-0.060) | (-0.073) | (-0.107) |
| Spouse: age | -0.009** | -0.008 | 0.000 |
| | (-0.004) | (-0.005) | (-0.008) |
| Spouse: wage level | $-6.56/10^7$** | $-1.46/10^6$** | $-4.12/10^11$** |
| | $(3.24/10^7)$ | $(3.83/10^7)$ | $(5.90/10^7)$ |
| Spouse: high education level | -0.241** | -0.276** | 0.009 |
| | (-0.064) | (-0.071) | (-0.138) |
| Spouse: medium education level | -0.042 | -0.104* | 0.220* |
| | (-0.053) | (-0.058) | (-0.121) |
| Spouse: speaks English v. well | -0.437** | -0.432** | -0.464** |
| | (-0.068) | (-0.077) | (-0.151) |
| Spouse: speaks English well | -0.375** | -0.384** | -0.361** |
| | (-0.062) | (-0.069) | (-0.143) |
| Spouse: speaks some English | -0.169** | -0.140** | -0.304** |
| | (-0.056) | (-0.061) | (-0.139) |
| N | 19,926 | 15,170 | 4,756 |

Note: * indicates statistical significance at the 10% significance level, ** at the 5% significance level. Brackets indicate robust standard errors. All regressions included a constant.

Table A4: Coefficients from reduced-form regressions with wages as dependent variable

| Individual characteristic | Full sample | Men only | Women only |
|---|---|---|---|
| Weekly hours | 0.024** | 0.020** | 0.032** |
| | (-0.001) | (-0.001) | (-0.017) |
| Age | 0.030** | 0.031** | 0.029** |
| | (-0.006) | (-0.006) | (-0.012) |
| Age squared | -0.0003** | -0.0004** | -0.0003** |
| | (-0.0001) | (-0.0001) | (-0.0001) |
| Female | -0.299** | – | – |
| | (-0.017) | | |
| High education level | 0.293** | 0.302** | 0.290** |
| | (-0.025) | (-0.028) | (-0.053) |
| Medium education level | 0.054** | 0.042** | 0.115** |
| | (-0.019) | (-0.019) | (-0.049) |
| Speaks English v. well | 0.284** | 0.279** | 0.303** |
| | (-0.027) | (-0.031) | (-0.055) |
| Speaks English well | 0.134** | 0.147** | 0.098* |
| | (-0.024) | (-0.027) | (-0.052) |
| Speaks some English | 0.056** | 0.076** | -0.009 |
| | (-0.023) | (-0.026) | (-0.050) |
| Other language at home | -0.290** | -0.293** | -0.238** |
| | (-0.036) | (-0.044) | (-0.066) |
| Black | 0.017 | -0.054 | 0.107* |
| | (-0.029) | (-0.035) | (-0.056) |
| Years since migration | 0.008** | 0.008** | 0.008** |
| | (-0.001) | (-0.001) | (-0.002) |
| Origin fixed effects | Yes | Yes | Yes |
| Occupation fixed effects | Yes | Yes | Yes |
| Spouse: has a disability | -0.074** | -0.052* | -0.120** |
| | (-0.025) | (-0.031) | (-0.041) |
| Spouse: age | 0.005** | 0.005** | 0.000 |
| | (-0.001) | (-0.002) | (-0.003) |
| Spouse: wage level | $1.01/10^{6}$** | $1.17/10^{6}$** | $1.01/10^{6}$** |
| | $(1.36/10^{7})$ | $(1.79/10^{7})$ | $(2.07/10^{7})$ |
| Spouse: high education level | 0.120** | 0.129** | 0.036 |
| | (-0.022) | (-0.026) | (-0.047) |
| Spouse: medium education level | 0.034* | 0.041** | -0.018 |
| | (-0.018) | (-0.019) | (-0.046) |
| Spouse: speaks English v. well | 0.052** | 0.070** | -0.032 |
| | (-0.024) | (-0.027) | (-0.049) |
| Spouse: speaks English well | 0.02 | 0.028 | -0.027 |
| | (-0.021) | (-0.024) | (-0.047) |
| Spouse: speaks some English | -0.008 | -0.004 | -0.034 |
| | (-0.018) | (-0.020) | (-0.043) |
| N | 19,926 | 15,170 | 4,756 |

Note: * indicates statistical significance at the 10% significance level, ** at the 5% significance level. Brackets indicate robust standard errors. All regressions included a constant.